

Mid-Year Report from the Rasmuson Fellows

Continuing Students

William Bechtol, Ph.D. Fisheries

Retrospective Analysis of Kodiak Red King Crab

Using a three-stage catch survey analysis, I developed a preliminary reconstruction of male red king crab abundance for 1972-2004. Initial results showed the timing and magnitude of abundance peaks to be similar to previous studies that used a two-stage catch survey analysis. Work continues on the catch-length analysis that will extend male abundance estimates to 1960. I am also working on a growth probability matrix for female crab as a step toward reconstructing female crab abundance. Efforts are ongoing to obtain both habitat and trophic interaction data. My coursework will be completed in December 2006.

Carrie (Belben) Parris, M.S. Marine Biology

Bottom-up influences on intertidal clam communities in Kachemak Bay, Alaska.

My thesis project of bottom-up influences on intertidal clam communities in Kachemak Bay, Alaska is aiming to answer three main questions. These questions are: 1) Are the clam communities different within various regions of Kachemak Bay, Alaska? 2) Does food concentration influence clam communities and body condition of clams within these various regions? 3) Does sediment grain size influence the clam community? The results that I have gathered, thus far are indicating that clam communities are distinct among 4 different regions within Kachemak Bay, both in terms of species composition and abundance. Furthermore, clam abundances appear to be independent of grain size. Currently, I am continuing with my data analysis to complete the answers to my questions, as well as to further understand the ecological influences on these recreational and subsistence resources. I am anticipating a summer 2007 graduation with my defense at the end of June 2007, followed by a manuscript submission for publication to Estuarine, Coastal and Shelf Science.

Shannon Hanna, M.S. Marine Biology

*Interrelationships among temperature, metabolism and swimming performance in Pacific cod (*Gadus macrocephalus*): implications of a changing climate*

Graduated December 2006

Joel Markis, M.S. Marine Biology

Essential larval and juvenile fish habitat in nearshore waters of Kachemak Bay, Alaska

My project is progressing smoothly. I have successfully established nine sites with varying substrate complexity and kelp cover. Monthly sampling began in June with SMURF and light

trap deployment as well as habitat and visual fish surveys. This sampling has taken place every month and will continue through the winter and next summer. Thus far I have captured and or identified at least 20 species of fish and am in the process of looking at the special distribution of these fish across my sites. I foresee no barriers to the completion of my project or degree.

Katie Palof, M.S. Fisheries

*Developing a genetic population dynamics model: Integration of genetic data into spatial modeling techniques for Pacific ocean perch (*Sebastes alutus*)*

Currently I am finishing up my thesis for my masters project, the predecessor to this project, the "Population genetic structure of Alaskan Pacific ocean perch (*Sebastes alutus*)". The analysis for this project has been lengthy and intense but we have found substantial structure that is correlation with geographic location and we have been able to characterize the population with more detail than expected. The initial stages of my doctorate project involved reviewing and further analyzing the data obtained for my masters thesis, which is currently being performed. I hope to defend this spring and then move on to the next steps in my doctorate project, which are assessing the error involved in microsatellites by exploring null alleles and exploring simple models to incorporate population movement. I would like to thank the Rasmuson foundation for the opportunity to perform this research.

Cindy Tribuzio, Ph.D. Fisheries

*Abundance, Life History, and Population Demographics of Spiny Dogfish, *Squalus acanthias**

The spiny dogfish in the Gulf of Alaska project is funded by NPRB and works cooperatively with NMFS, ADF&G and the University of Washington. The objective is to describe the population dynamics and ecology of spiny dogfish to aid the Board of Fish in future management decisions about a potential commercial fishery. I have just completed the third year of field work and am currently working on lab work, consisting of diet analysis and reading age structures. Early results suggest that spiny dogfish are generalist feeders, with no one item comprising a significant portion of the diet. Preliminary demographic analyses have been conducted to estimate growth, maturity and natural mortality. Laboratory work is expected to be completed spring 2007 and detailed data analysis will follow.

New Students Funded 2006

Sean C. Rooney, M.S. Fisheries

Habitat analysis of major fishing grounds on the Kodiak Shelf, Alaska

My research activities to date have largely focused on processing the submersible video transects. Initial observations appear to support the idea that habitat structure is important to several commercially important fish species. I have also identified several areas which appear to be important juvenile rockfish habitats, and even documented one site where extremely gravid rockfish adults occur. While video processing is now proceeding smoothly, with approximately one third of the video transects completed to date, unforeseen delays related to software and hardware issues have slowed my progress and I now expect to complete the video processing by the end of March 2007. In addition to conducting video processing I have also been acquiring

new multibeam and benthic sediment data sets from NOAA and the USGS. These data should provide me with a more regional perspective of benthic habitats and there by result in a much more useful final product than would have resulted from analysis of the habitat mapped areas alone. Finally I also attended a training class on Primer, multivariate statistical software, which I will be using to conduct my data analysis. My revised plan is to continue my data analysis and thesis writing into the summer and fall 2007 sessions, and defend my thesis by mid-fall of 2007.

Katy Howard, M.S. Fisheries

*Inter-decadal change in sablefish (*Anoplopoma fimbria*) growth and maturity in the northeast Pacific Ocean*

I was very fortunate to join the F/V Alaskan Leader crew on Leg Six of the annual NMFS longline survey this past summer. Although this data collected will not be incorporated into my thesis work, the hands on experience was invaluable, especially in helping understand what it is that I'm looking at with my data. And it was fun! Because sampling methods have not been consistent over the years during these surveys, I'm currently overcoming the problem of converting length stratified data into random length sampled data. With this, I will then look for stations throughout the state that have been consistently sampled each year, and apply growth analysis to these various areas to compare different growth rates in different areas. Preliminary results of old data (1981-1996) compared with new data (1997-2003) show significant growth changes in sablefish over this amount of time. It is my goal to have comprehensive growth analysis completed by July 2007 for use in next year's Alaska Sablefish Assessment.

Ashwin Sreenivasan, Ph.D. Fisheries

Seasonal Variations in Metabolic Parameters of Forage Fish (Pacific herring, capelin, and eulachon)

The primary objective of my project is to demonstrate the effect of seasonal variations in the activity of specific muscle enzymes on growth of juvenile fish. This method of assessing physiological growth condition should have applicability in a variety of ecological studies. Presmolt Coho and Chinook salmon maintained under laboratory conditions were sampled on a monthly basis. I have been able to get the various enzyme assays to run satisfactorily, and am currently analyzing these samples. I have also been cooperating with the NOAA Auke Bay Laboratory to obtain juvenile eulachon and Pacific herring. We have carried out numerous sampling trips in the Fritz Cove/Berners Bay areas of Juneau, evaluating different methods to capture fish, including light traps and a frame trawl. In addition, habitat parameters including water temperature, salinity, depth, turbidity, and pH have been measured. Vertical plankton tows have also been carried out. A trawl survey has been planned for Fritz Cove and Berners Bay in early January 2007, to sample juvenile eulachon and herring.